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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/579,389	06/14/2006	Takafumi Suzuki	2006-0741A	6578

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EXAMINER	
LACLAIR, DARCY D	
ART UNIT	PAPER NUMBER
1796	

MAIL DATE	DELIVERY MODE
12/31/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/579,389	SUZUKI ET AL.	
	Examiner	Art Unit	
	Darcy D. LaClair	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 October 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-7,11,12,14 and 17-30* is/are pending in the application.

4a) Of the above claim(s) *3-7 and 14* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,11,12 and 17-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on **10/7/2009** has been entered.

All outstanding rejections, except for those maintained below are withdrawn in light of the amendment filed on **10/7/2009**.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Objections

2. **Claim 30** is objected to because of the following informalities: Applicant has misspelled tetraethoxysilane as “tetraethoxysil**i**ne." Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. **Claims 1, 11-12, 17-19, 21, 24-26 and 30** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Enoki et al**. (**WO 03/010091**) with evidence from **Silicone (Si) and Water** (**Lenntech, 1989**)

It is noted that the international Patent Application WO publication is being utilized for date purposes. However, since **WO 03/010091** is in Japanese, in the discussion below, the US equivalent for **WO 03/010091**, namely **US 2004/0147660**, respectively, is referred to in the body of the rejection below. All column and line citations are to the US equivalent.

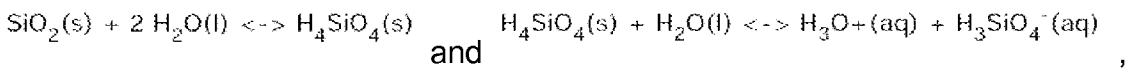
It is noted that **Claims 1, 12, 17 and 25**, with respect to the production of the calcium hydroxide, is stated in product by process format.

"[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985)

Absent showing of criticality, the process limitations in a product-by-process claim do not carry patentable weight. Nevertheless, where the process is taught by Enoki, it is set forth below.

With respect to Claims 1 and 25, Enoki teaches alkaline earth metal basic silicate particles which are useful as a stabilizer for chlorine containing polymers. (See abstract) The alkaline earth metal hydroxide is calcium hydroxide (see par [0020]) and the particles have a silicate of the alkaline earth metal on the surface, having a SiO_2/MO molar ratio in the range from 0.01 to 0.9. (See par [0018]) This is consistent with x of 0.01 to 0.9. The CaOH-silicate particles were prepared by blending and heating CaOH and amorphous silicic acid, followed by dry solidification. (See par [0031]) This reaction terminates with a pH of 12.8, which is highly basic. Amorphous silicic acid is SiO_2-nH_2O, and when in an aqueous solution, the silica will react with water to form -OH

groups pendant to the SiO_2. This will cause metasilic and orthosilic (see below) acid to be formed:



$$SiO_2(s) + 2\,H_2O(l) <-> H_4SiO_4(s) \quad \text{and} \quad H_4SiO_4(s) + H_2O(l) <-> H_3O^+(aq) + H_3SiO_4^-(aq)$$

or $SiO(OH_3)^-$. (See Lenntech) Furthermore, additional dissociation of the hydrogen due to the basic conditions will yield species such as $SiO_2(OH)_2^{2-}$ and SiO_4^{4-}. Under these conditions, it is also expected that the silica would react to form disilicic acid and pyrosilicic acid in solution, which would dissociate under very basic conditions to form additional silicic anionic species claimed by applicant. These species have n of 1 to 4. The anions are then available to react with the calcium hydroxide and replace a portion of the OH as the anion, forming a calcium hydroxide having a small substitution in the range 0.01 to 0.9 mols of the silicia anion, as taught by Enoki. Enoki teaches that particles have a BET specific surface area of 20 to 150 m^2/g and a median diameter of 0.1 to 20 μm. (See par [0093]) The BET specific surface area overlaps with applicant's required range. It is well settled that where the prior art describes the components of a claimed compound or compositions in concentrations within or overlapping the claimed concentrations a prima facie case of obviousness is established. See *In re Harris*, 409 F.3d 1339, 1343, 74 USPQ2d 1951, 1953 (Fed. Cir 2005); *In re Peterson*, 315 F.3d 1325, 1329, 65 USPQ 2d 1379, 1382 (Fed. Cir. 1997); *In re Woodruff*, 919 F.2d 1575, 1578 16 USPQ2d 1934, 1936-37 (CCPA 1990); *In re Malagari*, 499 F.2d 1297, 1303, 182 USPQ 549, 553 (CCPA 1974)

With regard to Claim 11, Enoki teaches that the alkaline earth metal is treated with a silicate (silicon based compound) to form a surface layer of alkaline-earth methal hydroxide. (See abstract) This forms a layer on the surface of the particles which improves stability. (See par [0013])

With regard to Claim 12, Enoki teaches that the particles (see description, above with regard to Claims 1 and 25) are used in chlorine containing polymers to prepare a resin composition. (See par [0127],[0128])

With regard to Claim 17, Enoki teaches that the particles are blended in an amount from 0.01 to 10 parts by weight in a chlorine containing polymer. (See par [0126]) With regard to the specific limitations with respect to the surface treatment, formula, and characteristics of the particle, attention is directed to the discussion of **Claims 1 and 25 and 11**.

With regard to Claim 18, Enoki teaches polyvinyl chloride. (See par [0127])

With regard to Claim 19, Enoki teaches that other stabilizers can be used in combination with the silicate particles, such as zeolite (see par [0097]) having ions such as Zn, Mg, or the like. (See par [0100]) Enoki exemplifies hydrotalcite as one of these stabilizers. (See par [0220])

With regard to Claim 21 and 26, the zeolite stabilizer is used in a preferable ratio of 2:8 to 8:2. (See par [00100])

With regard to Claim 24, Enoki teaches that the polymer composition is molded. (See par [0129])

With regard to Claim 30, Enoki teaches that an amorphous silicic acid was used in the reaction. (See par [0079]) This is amorphous silica.

4. **Claims 20, 23 and 27** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Enoki et al**. (**WO 03/010091**) in view of **Katsuki et al.** (**US 6,291,570**) with evidence from **Silicone (Si) and Water** (**Lenntech, 1989**)

The discussion of **Enoki** and **Silicone**, above in **paragraph 3**, is incorporated here by reference.

With regard to Claim 20 and 27, Enoki teaches that other stabilizers can be used in combination with the silicate particles, (see par [0097]) and exemplifies hydrotalcite. (See par [0220]) Enoki does not explicitly teach a formula for the hydrotalcite. Katsuki teaches a heat deterioration resistant synthetic resin composition which incorporates a hydrotalcite (see col 3 ln 37-60) of a specific formula, $M_{1-x}Al_x(OH)_2A^{n-}_{x/n}\cdot H_2O$ where M can be Mg or Zn. Mg is preferably greater than Zn, which is consistent with applicant's requirement that Y is 0.5 to 1 and Z is 0 to 0.5. Katsuki teaches that X is 0 to 0.5 and m is 0 to 1, which is also consistent with applicant's requirements. Katsuki indicates that A^{n-} may be CO_3^{2-}, or an oxyacid anion of S. (See col 3 ln 50 – col 4 ln 21) That is consistent with applicants CO_3^{2-} and SO_4^{2-}. It would be obvious to one of ordinary skill in the art to use the hydrotalcite of Katsuki which improves the heat deterioration of a synthetic resin, as the hydrotalcite stabilizer of Enoki's synthetic resin composition.

With regard to Claim 23, Katsuki teaches that the hydrotalcite is preferably blended with a surface treatment agent before being combined with a resin. For surface treating agents, Katsuki teaches higher fatty acids, anionic surfactants, phosphoric acid esters, coupling agents (including silcate-, titanate-, and aluminum-based), and esters of polyhydric alcohols and fatty acids.

5. **Claim 22** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Enoki et al**. (**WO 03/010091**) in view of **Katsuki et al.** (**US 6,291,570**), **Miyata et al.** (**US 3,879,525**) and **Kooli et al.** (**J. Mat. Sci, 1993**) with evidence from **Silicone (Si) and Water** (**Lenntech, 1989**)

The discussion of **Enoki** and **Silicone**, above in **paragraph 3**, and **Enoki** and **Katsuki** and **Silicone**, above in **paragraph 4**, is incorporated here by reference.

With regard to Claim 22, Katsuki teaches that the method and condition for producing the hydrotalcite is not limited as long as certain conditions are obtained. (See col 5 ln 5-19) Katsuki directs the reader to methods which are known and will produce source materials (hydrotalcite) in accordance with the invention, including the work of Miyata. Calcination is a thermal treatment designed to bring about thermal decomposition, phase transition, or purification, which takes place at or above the thermal decomposition temperature. Miyata provides the thermal decomposition temperature for a variety of hydrotalcites containing zinc and aluminum. (Table 10)

Table 10

Kind of product	Decomposition temperature (°C.) (according to D.T.A. analysis)
$Zn_4Al_2(OH)_{12}SO_4.3H_2O$	260
$Zn_4Al_2(OH)_{12}Cr_2O_7.3H_2O$	320
$Zn_4Al_2(OH)_{12}CrO_4.3H_2O$	290
$Zn_4Al_2(OH)_{12}S_2O_3.3.5H_2O$	300
$Zn_4Al_2(OH)_{12}S_2O_7.3H_2O$	290
$Zn_4Al_2(OH)_{12}SO_3.4H_2O$	245
$Zn_4Al_2(OH)_{12}B_2O_7.6H_2O$	300

It is obvious from this table that many hydrotalcites have decomposition temperature in the range 250-325°C. Kooli also provides data for Mg-Zn-Al hydrotalcite like compounds. Based on DTA analysis, a peak is noted between 150 and 180°C (used to determine decomposition temperatures, see Miyata '525) In both of these cases, in order to perform calcination at a temperature above the decomposition temperature, as is standard protocol, it would be mandatory to perform the operation at a temperature at or above 200°C.

6. **Claims 1, 11-12, 17-19, 21, 24-26, 27, 28, 29 and 30** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Enoki et al**. (**WO 03/010091**) in view of **Katsuki et al.** (**US 6,291,570**) and **Miyata et al.** (**US 6,592,834**) with evidence from **Silicone (Si) and Water** (**Lenntech, 1989**)

The discussion of **Enoki** and **Silicone**, above in **paragraph 3**, is incorporated here by reference.

With regard to Claims 1, 12, 17 and 25, attention is first directed to the discussion of Claims 1 and 25, above. Enoki teaches that particles have a BET specific surface area of 20 to 150 m^2/g and a median diameter of 0.1 to 20 μm. (See par [0093])

Miyata further teaches that the BET specific surface area almost corresponds to the size of the particles, and a BET specific surface area of 7 to 20 m^2/g is a preferable size for the particle, so the particles will not agglomerate, the viscosity will not be increased too high so that it is difficult to knead the resin composition, and moldability will not be deteriorated. (See col 3 line 3-15) The particle size, which correlates to the BET specific surface area, is, for the secondary particle diameter, preferably from 0.1 to 1.5 mm. (See col 2 line 61-65) Based on the teaching of Miyata as to the use of a calcium hydroxide particle in composition which is preferably a halogen containing resin (see col 4 line 56-59), it would be obvious to one of ordinary skill in the art to obtain the treated calcium hydroxide particles of Enoki in the size and surface area as taught by Miyata for optimal use in resin blends.

With regard to Claims 11, 18-19, 21, 24, 26 and 30, since the particular limitations of these Claims have been discussed above, in **paragraph 3**, attention is drawn to the discussion of these claims above.

With regard to Claims 28 and 29, Enoki teaches alkaline earth metal basic silicate particles which are useful as a stabilizer for chlorine containing polymers. (See abstract) The alkaline earth metal hydroxide is calcium hydroxide (see par [0020]) The calcium hydroxide is reacted with an amorphous silicic acid by mixing well and heating at a temperature from 50 to 100oC from 1 to 10 hours. Enoki does not explicitly the starting components of the calcium hydroxide or how the calcium hydroxide is prepared. Miyata teaches that calcium hydroxide can be obtained by a process comprising adding a water-soluble calcium salt aqueous solution to an aqueous solution containing at least

one equivalent of alkali metal hydroxide. (See col 2 line 18) The calcium salt is calcium chloride or calcium nitrate and the alkali metal hydroxide is sodium hydroxide or potassium hydroxide. (See col 3 line 20-23) The calcium hydroxide is prepared by mixing the calcium salt and the alkali metal hydroxide at 40°C to 90°C with stirring for 0.1 to 2 hours, and then adding a surface treating agent. (See col 3 line 24-30). Given the similar reaction conditions, it would be obvious to one of ordinary skill in the art to prepare an aqueous solution of calcium salt and alkali metal hydroxide as described by Miyata, and add to that mixture the surface treatment, namely the amorphous silicic acid in order to reduce the total number of processing steps. Accordingly, it would be obvious to use an aqueous reaction of calcium salt which is calcium chloride or calcium nitrate with an alkali metal hydroxide which is sodium or potasium hydroxide.

Response to Arguments

7. Applicant's arguments filed **10/7/2009** have been fully considered. Specifically, applicant argues

(A) Applicant has amended Claims 1, 12, 17 and 15 to recite “X represents a number of 0.01 to 0.2," to incorporate the phrase ‘in the presence of a silicon-based compound" and to specify that An- is one or a mixture of silicon based formulas, and to specify the average secondary particle diameter and BET specific surface area. Additionally, Claim 30 has been added.

(B) Hidekazu discloses calcium hydroxide digested with water and an organic acid but does not disclose the silica compounds of applicant’s amended claims.

(C) Miyata teaches calcium hydroxide obtained by slacking a quicklime having small content of impurities, such as silicone dioxide (col 2, lines 33-35), preferably a content of 0.2% by weight or less, and the examples show calcium hydroxide containing 0.01% or less; thus it is clear that this is an unfavorable substance in Miyata, whereas applicants intentionally include the silicon based compound in the calcium hydroxide. Additionally, it is noted that the anion is contained in calcium hydroxide as a solid solution in the invention, as shown on page 5, line 27 of the specification. Two X-ray diffraction charts are enclosed demonstrating this. The calcium hydroxide is also present in the form of fine crystals due to the inhibition of crystal growth during the production process by the silicon compound, giving it a high surface area.

(D) Neither Katsuki nor Kooli remedy the deficiencies of Miyata and Hidekazu.

8. **With respect to argument (A),** the support for the amendments is acknowledged on page 5, line 24, lines 10, 12, and 16, in original Claim 2, on page 6 line 34, in original Claim 10, and in Table 7, page 37.

With respect to argument (B), (C) and (D), applicant's arguments have been considered and the rejection has been withdrawn ***in light of applicant's amendment.***

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Darcy D. LaClair whose telephone number is (571)270-5462. The examiner can normally be reached on Monday-Friday 8:30-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Milton Cano can be reached on 571-272-1398. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Milton I. Cano/
Supervisory Patent Examiner, Art Unit 1796

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Examiner
Art Unit 1796

/DDL/